

We claim:

1. A method of making an infrared detection medium, comprising the steps of:
  - dissolving a polymer and at least one chromophore dye in a solvent to form a chromophore dye/polymer/solvent mixture, wherein said at least one chromophore dye emits visible lights when irradiated with infrared light;
  - placing the resulting mixture onto a surface to substantially evaporate the solvent and form a substantially dry chromophore dye containing polymer film.
2. The method of making an infrared detection medium according to claim 1, wherein the at least one chromophore dye is selected from the group consisting of a Type 1 chromophore, a Type 2 chromophore, a Type 3 chromophore, and a Type 4 chromophore.
3. The method of making an infrared detection medium according to claim 2, further comprising the steps of:
  - pressing at least a portion of the substantially dry polymer film between first and second transparent substrates;
  - heating the substrates to a temperature below the polymer melting temperature until the polymer film adheres to the substrates.
4. The method of making an infrared detection medium according to claim 3, wherein the polymer is polyvinyl butyral.

5. The method of making an infrared detection medium according to claim 4, wherein the solvent is methylene chloride.

6. The method of making an infrared detection medium according to claim 2, wherein the step of dissolving a polymer and at least one chromophore dye in a solvent to form a chromophore dye/polymer/solvent mixture further comprises the steps of:

layering one or more layers of the substantially dry polymer film between first and second transparent substrates;

heating the substrates to a temperature above the polymer melting temperature until the chromophore dye/polymer mixture undergoes a separation of phases.

7. The method of making an infrared detection medium according to claim 6, wherein the polymer is polyvinyl butyral.

8. The method of making an infrared detection medium according to claim 7, wherein the solvent is methylene chloride.

9. The method of making an infrared detection medium according to claim 2, wherein the step of dissolving a polymer and at least one chromophore dye in a solvent to form a chromophore dye/polymer/solvent mixture further comprises the step of:

adding scattering beads to the chromophore dye/polymer/solvent solution.

10. The method of making an infrared detection medium according to claim 9, wherein the polymer is polyvinyl butyral.

11. The method of making an infrared detection medium according to claim 10, wherein the solvent is methylene chloride.

12. A method of making an infrared detection card having a transparent region for visibly detecting infrared radiation and an opaque region for visibly detecting infrared radiation, comprising the steps of:

forming a substantially transparent infrared detection medium;

forming a substantially opaque infrared detection medium;

mounting the substantially transparent infrared detection medium and the substantially opaque infrared detection medium on a substrate.

13. The method of making an infrared detection card having a transparent region for visibly detecting infrared radiation and an opaque region for visibly detecting infrared radiation according to claim 12, wherein the substrate includes laser safety warning information.

14. The method of making an infrared detection card having a transparent region for visibly

detecting infrared radiation and an opaque region for visibly detecting infrared radiation according to claim 13, wherein the substrate comprises cardboard.

15. A method of making an infrared detection card having a transparent region for visibly detecting infrared radiation, comprising the steps of:

forming a substantially transparent infrared detection medium;

mounting the substantially transparent infrared detection medium on a substrate.

16. The method of making an infrared detection card having a transparent region for visibly detecting infrared radiation according to claim 15, wherein the substrate includes laser safety warning information.

17. The method of making an infrared detection card having a transparent region for visibly detecting infrared radiation according to claim 16, wherein the substrate comprises cardboard.

18. A method of making an infrared detection card having an opaque region for visibly detecting infrared radiation, comprising the steps of:

forming a substantially opaque infrared detection medium;

mounting the substantially opaque infrared detection medium on a substrate.

19. The method of making an infrared detection card having an opaque region for visibly

detecting infrared radiation according to claim 18, wherein the substrate includes laser safety warning information.

20. The method of making an infrared detection card having an opaque region for visibly detecting infrared radiation according to claim 19, wherein the substrate comprises cardboard.

21. A method of using an infrared laser detection card having an opaque region for visibly detecting infrared radiation to detect mode-lock operation in a mode-lock infrared laser, comprising the steps of:

inserting the opaque region of the card into the beam path of the infrared laser; and  
observing the opaque region of the card to determine if the laser is operating in a mode-lock state.

22. An infrared detection card having a substantially transparent region for visibly detecting infrared radiation and a substantially opaque region for visibly detecting infrared radiation, consisting of:

a substantially transparent infrared detection medium;  
a substantially opaque infrared detection medium;  
wherein the substantially transparent infrared detection medium and the substantially opaque infrared detection medium are mounted on a substrate.

23. The infrared detection card having a substantially transparent region for visibly detecting infrared radiation and a substantially opaque region for visibly detecting infrared radiation according to claim 22, wherein the substrate includes laser safety warning information.

24. The infrared detection card having a substantially transparent region for visibly detecting infrared radiation and a substantially opaque region for visibly detecting infrared radiation according to claim 23, wherein the substrate comprises cardboard.

25. An infrared detection card having a substantially transparent region for visibly detecting infrared radiation, consisting of:

a substantially transparent infrared detection medium;  
wherein the substantially transparent infrared detection medium is mounted on a substrate.

26. The infrared detection card having a substantially transparent region for visibly detecting infrared radiation according to claim 25, wherein the substrate includes laser safety warning information.

27. The infrared detection card having a substantially transparent region for visibly detecting infrared radiation according to claim 26, wherein the substrate comprises cardboard.

28. An infrared detection card having a substantially opaque region for visibly detecting infrared radiation, consisting of:

a substantially opaque infrared detection medium;

wherein the substantially opaque infrared detection medium is mounted on a substrate.

29. The infrared detection card having a substantially opaque region for visibly detecting infrared radiation according to claim 28, wherein the substrate includes laser safety warning information.

30. The infrared detection card having a substantially opaque region for visibly detecting infrared radiation according to claim 29, wherein the substrate comprises cardboard.

31. A method of forming an infrared laser detection card, the method comprising:

combining a chromophore with monomer to form a mixture;

polymerizing the mixture to form a solid;

hot-pressing the solid to form the infrared laser detection card.

32. The method of forming an infrared laser detection card according to claim 31, wherein the chromophore is selected from the group consisting of a Type 1 chromophore, a Type 2 chromophore, a Type 3 chromophore, and a Type 4 chromophore.

33. The method of forming an infrared laser detection card according to claim 32, wherein the monomer is styrene.

34. The method of forming an infrared laser detection card according to claim 32, wherein the monomer is methyl-methacrylate.

35. A method of measuring the duration of mode-locked laser pulses, the method comprising:  
projecting a mode-locked laser beam into the input of a nonlinear pulse autocorrelator apparatus for splitting the beam into two beams that follow different optical paths;  
projecting the two beams onto an infrared laser detection card to illuminate at least a portion of the detection card;  
detecting the visible fluorescence intensity of the illuminated portion of the detection card as a function of the temporal delay between the two beams.